

III. FUTURE CONDITIONS

The Study Team evaluated future conditions for different transportation modes. This section of the report presents the assessment of future parking needs, future bus bay requirements at the Metro station, needed expansion of bus service, forecast traffic volumes for 2012 and 2022 scenarios, and an assessment of traffic operations for the two future year scenarios.

FUTURE YEAR DEVELOPMENTS

In order to assess future conditions, the Consultant collected information on planned future developments in the study area. The main source of information for future levels of development was the Takoma Central District Plan. Additional information on future year development levels was gathered by the Consultant through meetings with several governmental institutions including the District of Columbia Office of Planning, the City of Takoma Park and the Maryland National Capital Park and Planning Commission (MNCPPC).

The Takoma District Plan identifies five priority redevelopment sites as well as the level of development associated with these sites. The Study Team assumed that these sites would be developed in the near future. Therefore, they were included in the 2012 future year scenario. As shown in Figure 36, other sites that were included in the 2012 scenario were the development in Takoma Park at the site of the proposed Municipal Parking, and redevelopment at Montgomery College and at the Adventist Hospital.

The Study Team developed the 2022 levels of development based on data on long-term potential development levels noted in the Central District plan as well as assessment from the District planners on the most likely scenarios for future year developments. The 2022 forecast levels of development are presented in Figure 36. As the figure shows, most of the long-term development in the study area is expected to take place in the vicinity of the Takoma Metro station.

TRAFFIC

The Study Team evaluated future traffic conditions taking into consideration growth in background traffic and traffic generated by forecast developments in the study area and assuming a ten-year and a twenty-year build out. The future traffic demand for the target-year is then estimated.

2012 Future Traffic Conditions

The Study Team evaluated future conditions taking into consideration growth in background traffic and traffic generated by new developments in the Study Area. Background traffic and new development traffic was added to existing traffic counts to determine future traffic volumes. The Study Team estimated traffic volumes and assessed future year traffic conditions for the years 2012 and 2022. The developments expected to be in place during these years are shown in Figure 36. This section summarizes the traffic forecasts and anticipated levels of service for the 2012 scenario.

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Figure 36. Future Development Map – 2012 and 2022

Background Growth

Background traffic growth is considered the component of traffic that increases due to region-wide increases in population and employment. Based on historical counts, the growth rate used for background traffic was one percent per year. All balanced traffic volumes were grown by this percentage to determine background growth in traffic volumes for ten years in the future.

New Development Traffic

With the help of the information contained in the Central District Plan, the Study Team identified a number of sites as new planned developments within and outside the immediate study area. These developments are presented in Figure 37.

Trip Generation

The trips generated by new developments were estimated based on the land use information and applying trip generation rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 6th Edition* (1997). The adjustments to account for transit usage were developed based on information provided in “Development Related Ridership Survey,” published by the Washington Metropolitan Area Transportation Authority. Table 13 summarizes the AM and PM peak hour traffic volume forecasts for all the developments expected to be in place by 2012.

As shown in the Tables, site 7 and site 8 generate more traffic than other sites, but these two sites have less traffic impact for the study area since these two locations are outside the study area. The new developments that are located in the study area are expected to generate 84 and 274 new trips during the AM and PM peak hours, respectively, by the year 2012.

Citizens of Takoma requested that the trip generation for site 1 be provided at different levels of development at this site. Table 14 presents a comparison of trip generation at different levels of residential development at site 1.

Trip Distribution and Trip Assignment

Trips were distributed on the basis of existing traffic patterns and information gathered from available traffic studies for selected sites. The projected year 2012 trip assignments at each of the study area intersections were estimated by combining the traffic assignments for the study area developments with the grown volumes (existing volumes grown by one percent per year for ten years). Figure 38 presents the projected peak hour trip assignments for the new developments for the design year of 2012. Figure 39 presents the total projected traffic volumes, which combine grown background traffic and site development traffic for the design year of 2012.

Click to View:

Figure 37. Future Development Map – 2012

Table 13
Summary of 2012 Trip Generation for Area Developments

Location*	Land Use	Trip Generation					
		AM Peak Hour Trips			PM Peak Hour Trips		
		Entering	Exiting	Total	Entering	Exiting	Total
1	95 DU 10,000 SF Retail	4	17	21	19	17	36
2	50 DU 10,000 SF Retail	2	9	11	17	15	32
3	50 DU 5,000 SF Retail	2	9	11	13	10	23
4	30 DU 10,000 SF Retail 10,000 SF Office	4	17	21	21	46	67
5	80 DU	4	16	20	16	8	24
6	8,500 SF Restaurant 7,500 SF Theater	0	0	0	61	31	92
7	980 New Students	130	12	142	116	57	173
8	124,800 SF Hospital Bldg. 134,546 SF Medical Office Bldg.	143	42	185	56	155	211
Total Area Development	305 DU 35,000 SF Retail 10,000 SF Office 8,500 SF Restaurant 7,500 SF Theater 980 Students 124,800 SF Hospital 134,546 SF Medical Office Bldg.	289	122	411	319	339	658

*See Figure 37 for location of proposed area developments

DU: Dwelling Units

SF: Square Feet

Table 14
2012 Trip Generation for Different Size of Residential Units at Site 1

Residential Unit Size	AM Peak Hour Trips			PM Peak Hour Trips		
	Entering	Exiting	Total	Entering	Exiting	Total
30 DU	3	11	14	6	4	10
60 DU	3	14	17	8	5	13
90 DU	4	16	20	11	7	18
95 DU	4	17	21	11	7	18

*See Figure 37 for location of proposed area developments

DU: Dwelling Units

SF: Square Feet

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Figure 38. Projected 2012 Peak Hour Site Trip Assignments

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Figure 39. Projected 2012 AM and PM Peak Hour Volumes

Future Levels of Service

SYNCHRO and SimTraffic were used to model and simulate future traffic conditions and to calculate the future year levels of service. The existing and projected 2012 Levels of Service are summarized in Figure 40.

In general, due to the area development and background growth, traffic conditions in the study area degrade. However, as shown in the figure, the new developments and the background growth are expected to have an effect on traffic operations in the study area. Thirteen of the 24 intersections are expected to operate at the same LOS as the existing LOS. The LOS at 11 of the intersections is expected to deteriorate, generally by one letter grade, during the AM peak hour. The LOS at nine of the intersections is expected to deteriorate, generally by one letter grade, during the PM peak hour. The mitigation measures noted in Section IV of this report would help address the impacts of the proposed 2012 developments.

2022 Future Traffic Conditions

In addition to evaluating traffic conditions for 2012, the Study Team evaluated future traffic conditions for 2022. Background traffic and new development traffic was added to existing traffic counts to determine future traffic volumes. This section summarizes the traffic forecasts and anticipated levels of service for the 2022 scenario.

Background Growth

Background traffic growth is considered the component of traffic that increases due to region-wide increases in population and employment. Based on historical counts, the growth rate used for background traffic was one percent per year. All balanced traffic volumes were grown by this percentage to determine background growth in traffic volumes for ten years in the future.

New Development Traffic

With the help of the information contained in the Central District Plan, the Study Team identified a number of sites as new planned developments within and outside the immediate study area. These developments are presented in Figure 41.

Trip Generation

The trips generated by new developments were estimated based on the land use information and applying trip generation rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 6th Edition (1997). The adjustments to account for transit usage were developed based on information provided in “Development Related Ridership Survey,” published by the Washington Metropolitan Area Transportation Authority. Table 15 summarizes the AM and PM peak hour traffic volume forecasts for all the developments expected to be in place by 2022 under a most likely scenario.

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Figure 40. Existing and 2012 Projected Levels of Service

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Figure 41. Future Development Map – 2022

Table 15
Summary of Trip Generation
for 2022 Most Likely Area Developments Scenario

Location*	Land Use	Trip Generation					
		AM Peak Hour Trips			PM Peak Hour Trips		
		Entering	Exiting	Total	Entering	Exiting	Total
1	95 DU 10,000 SF Retail	4	17	21	19	17	36
2	50 DU 16,000 SF Retail	2	9	11	22	21	43
3	50 DU 11,000 SF Retail	2	9	11	17	16	33
4	30 DU 16,000 SF Retail 10,000 SF Office	4	17	21	26	52	78
5	80 DU	4	16	20	16	8	24
6	8,500 SF Restaurant 7,500 SF Theater	0	0	0	61	31	92
7	980 New Students	130	12	142	116	57	173
8	124,800 SF Hospital Bldg. 134,546 SF Medical Office Bldg.	143	42	185	56	155	211
9	65 DU 10,000 SF Retail	3	13	16	20	17	37
10	123 DU 20,000 SF Retail	5	21	26	37	32	69
11	82 DU 10,000 SF Retail	4	17	21	24	19	43
12	12,000 SF Retail	0	0	0	9	12	21
Total Area Development	575 DU 105,000 SF Retail 10,000 SF Office 8,500 SF Restaurant 7,500 SF Theater 980 Students 124,800 SF Hospital 134,546 SF Medical Office Bldg.	301	173	474	423	437	860

*See Figure 41 for location of proposed area developments

DU: Dwelling Units

SF: Square Feet

As shown in the Table, the new developments that are located in the study area (sites 1 through 6 and sites 9 through 12) are expected to generate 151 and 476 new trips during the AM and PM peak hours, respectively, by the year 2022. In order to gain an understanding of the potential ranges in trip generation under different allowable development levels, the Study Team performed estimated trips for two alternative scenarios. The first scenario is based on the maximum level of residential units and the second scenario is based on a mixture of commercial and residential units. The details of land use and trip generation for the 2022 most likely scenario, the 2022 max residential scenario, and the 2022 mixed use scenario are presented in Table 16. As shown in the Table, the maximum mixed land use scenario for the year of 2022 would generate 76 percent more trips during the PM peak hour than the most likely scenario. The maximum residential scenario would generate slightly more trips than the most likely scenario during the AM peak hour, and slightly less trips during the PM peak hour.

Trip Distribution and Trip Assignment

Trips were distributed on the basis of existing traffic patterns and information gathered from available traffic studies for selected sites. The projected year 2022 trip assignments at each of the study area intersections were estimated by combining the traffic assignments for the study area developments with the grown volumes (existing volumes grown by one percent per year for 20 years). Figure 42 presents the projected peak hour trip assignments for the new developments for the design year of 2022, based on the most likely scenario. Figure 43 presents the total projected traffic volumes, which combine grown background traffic and site development traffic for the design year of 2022.

Future Levels of Service

SYNCHRO and SimTraffic were used to model and simulate future traffic conditions and to calculate the future year levels of service. The existing and projected 2022 Levels of Service are summarized in Figure 44.

As shown in the figure, the 2022 “most likely” development level would have a significant impact on traffic operations in the study area. Many intersections are expected to operate at LOS F during the AM and PM peak hours. The LOS would degrade for most of the intersections during the AM and PM peak hours.

The proposed mitigation measures, described in Section IV of this report, would help reduce the impacts of the 2022 “most likely” developments, but are not sufficient to accommodate the high levels of development associated with the “maximum 2022 mixed-use” scenario. Additional mitigation measures would be needed to accommodate the maximum 2022 mixed-use scenario.

Table 16
Land Use and Trip Generation for 2022 Scenarios

Location*	Land Use Type	Most Likely Scenario			Max Residential Scenario			Mixed Use Scenario		
		Land Use Size (DU/SF)	Total AM Peak Hour Trips	Total PM Peak Hour Trips	Land Use Size (DU/SF)	Total AM Peak Hour Trips	Total PM Peak Hour Trips	Land Use Size (DU/SF)	Total AM Peak Hour Trips	Total PM Peak Hour Trips
1	Residential Units	95	21	36	358	49	51	130	25	378
	Retail	10,000			0			196,000		
2	Residential Units	50	11	43	76	17	20	30	8	90
	Retail	16,000			0			45,000		
3	Residential Units	50	11	33	87	18	22	35	9	104
	Retail	11,000			0			52,000		
4	Residential Units	30	21	78	76	18	22	30	31	99
	Retail	16,000			0			25,000		
	Office	10,000			0			20,000		
5	Residential Units	80	20	24	86	22	26	86	22	26
6	Restaurant	8,500	0	92	8,500	0	92	8,500	0	92
	Theater	7500			7500			7,500		
7	Classroom	91,000	142	173	91,000	142	173	91,000	142	173
	Clinic	9,000			9,000			9,000		
	Cultural Arts Building	500			500			500		
8	Hospital Building	124,800	185	211	124,800	185	211	124,800	185	211
	Medical Office Building	134,546			134,546			134,546		
9	Residential Units	65	16	37	130	29	35	52	36	166
	Retail	10,000			0			58,544		
	Office	0			0			20,000		
10	Residential Units	123	26	69	326	60	77	130	67	371
	Retail	20,000			0			156,020		
	Office	0			0			40,000		
11	Residential Units	82	21	43	163	37	46	65	48	192
	Retail	10,000			0			68,010		
	Office	0			0			30,000		
12	Retail	12,000	0	21	20,000	13	75	30,000	0	54
	Office	0			10,000			0		
Total Area Development Traffic			474	860		535	812		551	1521

*See Figure 41 for location of proposed area developments

DU: Dwelling Units

SF: Square Feet

Click to View:

Figure 42. Projected 2022 Peak hour Site Trip Assignments

Click to View:

Figure 43. Projected 2022 AM and PM Peak hour Volumes

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Figure 44. Existing and Projected 2012 and 2022 Levels of Service

TRANSIT

With the assistance of the service providers in the area, the Washington Metropolitan Area Transit Authority (WMATA) and the Montgomery County Ride On (Ride On), the study team assessed future bus transit needs in the study area. Key transit origination points have been identified in the future which will impact the need for additional bus transit service to the Takoma area in general and the Metro Station, specifically.

Future Bus Service

At this juncture, WMATA does not anticipate the need to provide additional bus routes to the Takoma station, since the coverage area by the current routes includes the major roadways in the Takoma area and the in the District of Columbia. Ride On anticipates the addition of two new routes in the short term which will layover at the Takoma Metro Station. One route will service the rapidly growing Montgomery College, Takoma Park Campus and the other will provide local circulator service within the Takoma Park area. Montgomery College's Takoma Park campus is currently in the process of expanding to meet the needs of the community which it serves. The close proximity of the College to the Metro Station may provide a significant ridership increase and ultimately the need for additional bus routes which service both.

The headway for the local Ride-On route will likely by 20 – 30 minutes and is likely to be an all day route, rather than peak service only. The route servicing the college will operate on 30 – 60 minute headways and will also likely be an all day route, considering the higher concentrations of working students utilizing a community college.

The transit industry considers $\frac{1}{4}$ - $\frac{1}{2}$ mile a reasonable distance for a patron to walk to transit. Within the study area, each bus route was overlaid with a $\frac{1}{2}$ -mile wide corridor, centered about each route. The area south of the Metro station between Van Buren and Quackenbos Streets and 2nd and 3rd Streets is outside of the $\frac{1}{4}$ -mile transit coverage zone. In the off-peak periods the uncovered area extends between 5th Street and Blair road, south of Van Buren Street (see Figure 33). Currently there is no bus that provides service within Walter Reed Army Medical Center. Based upon these gaps in service area, the Study Team developed recommendations for new routes. Details on the recommended transit improvements are provided in the Summary of the Study Area Transportation Issues and Recommendations section of this report.

Bus Bay Needs at the Takoma Metro Station

The *Takoma Central District Plan* includes a redeveloped layout for the Takoma Metro Station. The existing site, which currently contains a bus turnaround area, nine bus bays, and a surface parking lot, would be redeveloped with retail and residential uses, a revamped bus depot, and short-term garaged Metrorail Station parking.

Based on forecasted transit service at the station, it was determined that a total of 12 bus bays would be needed at the redeveloped Takoma Metro station¹. Under a scenario with expanded bus service (two new Ride On routes, two additional routes recommended by this study, and increased frequencies for existing bus routes), 11 bus bays would be adequate to serve the needs of the Metro Station in the future, and one bus bay would be adequate for layovers. To assess the bus bay needs, several assumptions were made:

- There are three types of bus operations occurring at the Takoma Metro Station: “through” service, “turnaround” service” and peak period (unidirectional) service. These three types of service will be continued in the future.
- Peak periods of service are between 7:00AM – 8:30 AM and 5:00 PM – 6:30 PM.
- Bus bays serving buses operating with frequencies of six minutes or less would not be shared.

The addition of three bus bays (for a total of 12 bus bays) will be sufficient to accommodate more frequent transit service for the existing routes, the addition of two Ride On buses, and the addition of two WMATA bus routes recommended by this study.

PARKING NEEDS

The Study Team evaluated future parking needs for the commercial areas, new residential developments and for the Takoma Metro station. This subsection of the report describes the findings with respect to future parking needs.

Commercial Parking Needs for the Area around Old Town Takoma Park

The Study Team used the forecast future development levels to estimate future commercial parking needs for the year 2012. The future development levels are described in detail in the future development levels subsection above. Using these levels, the respective future parking need was determined for an area defined by the recommended maximum walking distance radius for short-term parking in an urban area, 800 feet² from the location of a proposed municipal parking facility to be located at the intersection of Eastern Avenue and Laurel Street. This approach follows what was used in determining the existing parking deficiency in this area described in section III of this report.

By using the respective jurisdiction’s zoning ordinance, off-street parking *requirements* were used as the determinant for parking *demand*. Table 17 shows the base parking requirements for

¹ Bus bay calculations are presented in Appendix H

² 800 feet walking distance chosen per maximum guideline for short-term, per *Parking*, Robert A. Weant and Herbert S. Levinson, Eno Foundation for Transportation, 1990, p. 211.

Washington, D.C. and Montgomery County according to their zoning ordinances. This requirement reflects the minimum number of spaces needed per gross square footage of particular land use, except for theaters and classrooms, which are dependent on seating available. Future parking demand was determined by computing a build-out scenario based upon current zoning ordinances. The proximity to the Metro Station results in reduced demand for parking. Since the zoning regulations for Montgomery County and for DC allow for the application of adjustments to the parking requirements to account for proximity to the Metro station, the calculation of parking requirements reflects adequately the demand for parking in the area.

Takoma Park is located within Montgomery County's Commercial Revitalization Zone. Under this regulation, future developments may be granted additional reductions in parking requirements exceeding that which is included in the existing zoning ordinance. These reductions were not included in the calculations for future requirements shown here as these factors have not yet been determined.

Table 17
Base Parking Requirements

Zoning/Land Use	District of Columbia	Maryland
	# of Spaces	# of Spaces
Educational		
College/High School	2 spaces for every 3 teachers <i>plus</i> 1 space for 10 auditorium seats	N/A
Elementary/J.H.S	2 spaces for every 3 teachers and staff	1 spaces for every teacher and staff
Office	Greater than 2000 ft ² , 1 space for each 600 ft ²	1.9, 2.1, or 2.4* spaces per 1000 ft ²
Restaurant	Fast Food – Greater than 1500 ft ² , 1 space for each 100 ft ² Other – Greater than 3000 ft ² , 1 space for each 300 ft ²	25 spaces per 1000ft ² **
Retail	Greater than 3000 ft ² , 1 space for each 300 ft ²	5 spaces per 1000ft ²
Service	Greater than 3000 ft ² , 1 space for each 300 ft ²	1.9, 2.1, or 2.4* spaces per 1000 ft ²
Special Purpose	1 space for each 600 ft ²	N/A
Theater		1 space per 4 seats in auditorium
Warehouse	1 space for each 3000 ft ²	N/A

* Office space requirements vary based upon the proximity of the business to a transit station. There are 1.9 spaces for business less than 800 feet from a station, 2.1 spaces for business between 800 and 1600 feet from a station, and 2.4 spaces for businesses greater than 1600 feet from a station.

** For restaurants, this requirement is applied to floor area devoted to patron use inside the establishment

Note: Both jurisdictions allow a 25 percent reduction in parking requirements within 800 feet of a transit center.

The result of the parking analysis was a parking assessment that detailed the existing inventory of parking and predicted future demand based on zoning. The parking assessment shows a summary of all types of businesses in Old Town Takoma Park and the required base parking requirement associated with each. The assessment confirms the analysis of the market profile that the existing off-street parking available in Old Town Takoma Park is insufficient for existing and future land uses. Table 18 shows the results of the parking evaluation. The Study Team estimated that the projected parking deficiency is 276 spaces.

Table 18
Future Parking Need within Walking Distance of Proposed Garage in Old Town Takoma Park

	Existing Parking (2002)	Existing Req'd Parking (2002)	Add'l Parking Required due to Future Dev.	Future Required Parking
DC				
Retail/Service Space	42	53	0	53
Office Spaces	0	8	0	8
Garage Spaces ⁺⁺	47	21	0	21
Warehouse Spaces	7	48	0	48
Religious	100	26	0	26
Educational	107	125	0	125
Other	37	35	0	35
On-Street, 2-hr in Res. Zone*	67			
On-Street, Metered**	38			
Off-Street Parking Lots	155			
SUBTOTAL[^]	553	296	0	296
MD				
Retail Spaces	28	238	0	238
Service Spaces	331	378	0	378
Restaurant Spaces	15	135	107	242
Classroom Spaces	0	0	60	60
Other (Theater) Spaces	0	0	19	19
On-Street – Metered**	30			
Off-Street Parking Lots	0			
SUBTOTAL	404	751	186	937
TOTAL	957	1,047		1,232
Additional Required Parking		90		276

*Assumed 50% of Residential Zone is available to General Short-Term Parking

⁺⁺ Since parking is self contained and may not be shared by other land use patrons, the surplus value is removed from the calculation of parking deficits for repair garages.

[^] Excludes parking for garage spaces (see note above)

** The use of all available metered parking in the calculations of parking requirements for the businesses around the proposed parking garage is a conservative approach because some of the metered parking spaces are used by metro station users and may not be available to business patrons.

This analysis demonstrates that the land use parking requirements within the recommended maximum walking distance for short-term parking can support a garage of 200+ spaces at the future development site in Old Town Takoma Park.

Generalized Commercial Parking Needs in the Study Area

With the future development levels, the required off-street parking, as dictated by the current zoning ordinances, is significant. Table 19 illustrates the collective magnitude of parking required for each future development that has commercial land uses (*e.g.* retail or office).

Table 19
Maximum Required Commercial Off-Street Parking Spaces for Future Developments Outside of Old Town Takoma Park

Future Development Site	2012	2022 Likely Scenario	2022 Max Scenario 1	2022 Max Scenario 2
1	24	24	0	0
2	24	44	0	140
3	7	27	0	164
4	38	58	0	104
5	0	0	0	0
6	See Table 18 Above			
7	Outside of Takoma Transportation Study Area			
8				
9				
10	-	57	0	64
11	-	24	0	264
12	-	30	71	90

With most of the above uses within walking distance to both the Metro station and each other, reductions in parking requirements due to proximity of a Metro station may be applied, in addition to other reductions allowable in the jurisdiction.

Metro Station Parking Needs

With the redevelopment of the present Takoma Metrorail station site, the existing parking will need to be maintained. The Metro station parking is currently being utilized at levels close to capacity. While the high utilization levels indicate that additional capacity may be needed, the desire to maintain the character of the station as one serving residents primarily, instead of commuters, dictates that the number of parking spaces should not be increased. A 1:1 replacement ratio for the existing parking spaces at the Metro station should be implemented with redevelopment at the Takoma Metro site. Short-term parking only for Metrorail patrons should be provided on site and commuter (long-term) parking should continue to be prohibited on site. Off-street long-term parking options should be provided, likely as privately operated parking.

Residential Parking Needs

Most of the future developments have residential units. Both jurisdictions have very stringent requirements for parking for residential developments. Considering the proximity of these developments to the Metrorail station, parking reductions may be pursued by the developers. Table 20 illustrates the base residential parking requirement for each of the future development scenarios.

Table 20
Maximum Required Residential Off-Street Parking Spaces for Future Developments within Study Area

Future Development Site	2012	2022 Likely Scenario	2022 Max Scenario 1	2022 Max Scenario 2
1	95	95	358	130
2	50	50	76	30
3	50	50	87	35
4	30	30	76	30
5	80	80	86	86
6	--	--	--	--
7	Outside of Takoma Transportation Study Area			
8				
9	--	65	130	52
10	--	123	326	130
11	--	82	163	65
12	--	--	--	--